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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Air Force									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 7: Operational Systems Development				R-1 ITEM NOMENCLATURE PE 0305164F: NAVSTAR Global Positioning System User Equipment Space							
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	121.798	137.163	165.936	0.000	165.936	137.950	120.084	128.755	130.730	Continuing	Continuing
673028: Navstar GPS	121.798	137.163	165.936	0.000	165.936	137.950	120.084	128.755	130.730	Continuing	Continuing
A. Mission Description and Budget Item Justification											
<p>The Global Positioning System (GPS) is a space-based radio Positioning, Navigation, and Time (PNT) distribution system. GPS User Equipment (UE) consists of standardized receivers, antennas, antenna electronics, etc., grouped together in sets to derive navigation and time information transmitted from GPS satellites. These receiver sets are used by DoD. RDT&E funds UE development, test, and analysis for new PNT receiver capabilities in Navigation Warfare (Navwar) across all military platforms using GPS services. Additionally, it funds the integration with service nominated Military GPS User Equipment (MGUE) lead platforms, development of software upgrades, product improvement studies, GPS UE test and evaluation and mission support.</p> <p>Due to increasing military dependence on GPS and emerging Electronic Warfare (EW) threat, the Navwar program was established to address EW solutions for GPS. Key elements of Navwar include protecting U.S. military and allies' use of GPS, preventing hostile exploitation of GPS, and preserving civil use of GPS outside the area of operations (AO). Military GPS User Equipment (MGUE) will continue the proof of concept work accomplished by the Modernized User Equipment (MUE) effort which laid the foundation for the next generation of air and ground GPS UE that will receive Y-code, Military (M)-code, and Coarse Acquisition code (YMCA).</p> <p>This program element is in Budget Activity 7 - Operational System Development, because UE supports operational systems.</p>											

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3600: Research, Development, Test & Evaluation, Air Force		PE 0305164F: NAVSTAR Global Positioning System User Equipment Space			
BA 7: Operational Systems Development					
B. Program Change Summary (\$ in Millions)					
	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	126.712	137.692	0.000	0.000	0.000
Current President's Budget	121.798	137.163	165.936	0.000	165.936
Total Adjustments	-4.914	-0.529	165.936	0.000	165.936
• Congressional General Reductions		-0.529			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-4.914	0.000	165.936	0.000	165.936
Change Summary Explanation					
-\$4.914M in FY09 reprogrammed for higher DoD priorities. -\$0.529M in FY10 for FFRDC. The FY2010 President's Budget submittal did not reflect FY2011 through FY2015 funding. Therefore, explanation of changes between the two budget positions cannot be made in a relevant manner.					

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 3600: <i>Research, Development, Test & Evaluation, Air Force</i> BA 7: <i>Operational Systems Development</i>				R-1 ITEM NOMENCLATURE PE 0305164F: <i>NAVSTAR Global Positioning System User Equipment Space</i>				PROJECT 673028: <i>Navstar GPS</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
673028: <i>Navstar GPS</i>	121.798	137.163	165.936	0.000	165.936	137.950	120.084	128.755	130.730	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
A. Mission Description and Budget Item Justification <p>The Global Positioning System (GPS) is a space-based radio Positioning, Navigation, and Time (PNT) distribution system. GPS User Equipment (UE) consists of standardized receivers, antennas, antenna electronics, etc., grouped together in sets to derive navigation and time information transmitted from GPS satellites. These receiver sets are used by DoD. RDT&E funds UE development, test, and analysis for new PNT receiver capabilities in Navigation Warfare (Navwar) across all military platforms using GPS services. Additionally, it funds the integration with service nominated Military GPS User Equipment (MGUE) lead platforms, development of software upgrades, product improvement studies, GPS UE test and evaluation and mission support.</p> <p>Due to increasing military dependence on GPS and emerging Electronic Warfare (EW) threat, the Navwar program was established to address EW solutions for GPS. Key elements of Navwar include protecting U.S. military and allies' use of GPS, preventing hostile exploitation of GPS, and preserving civil use of GPS outside the area of operations (AO). Military GPS User Equipment (MGUE) will continue the proof of concept work accomplished by the Modernized User Equipment (MUE) effort which laid the foundation for the next generation of air and ground GPS UE that will receive Y-code, Military (M)-code, and Coarse Acquisition code (YMCA).</p> <p>This program element is in Budget Activity 7 - Operational System Development, because UE supports operational systems.</p>											
B. Accomplishments/Planned Program (\$ in Millions)											
						FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
MAJOR THRUST: Development and testing, studies and engineering to assist User Equipment integration, software upgrades, product improvement studies, commercial GPS UE test and evaluation and missio... FY 2009 Accomplishments: In FY 2009: Military User Equipment (MUE) proof of concept efforts to provide technical foundation for next generation air, ground, space based and handheld GPS UE that will receive Y-code, Military (M)-code, and Coarse Acquisition code (YMCA).						121.798	137.163	165.936	0.000	165.936	

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B. Accomplishments/Planned Program (\$ in Millions)						FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
FY 2010 Plans: In FY 2010: Military User Equipment (MUE) proof of concept efforts to provide technical foundation for next generation air, ground, and handheld GPS UE that will receive Y-code, Military (M)-code, and Coarse Acquisition code (YMCA). Source selection for next generation Military GPS User Equipment (MGUE).											
FY 2011 Base Plans: In FY 2011: Military GPS User Equipment (MGUE) contract award for efforts for development of a Common GPS Module (CGM) to provide core signal processing functions within a secure module, and receiver cards for each domain (ground, air, maritime and handheld).											
FY 2011 OCO Plans: In FY 2011 OCO: Not Applicable.											
Accomplishments/Planned Programs Subtotals						121.798	137.163	165.936	0.000	165.936	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• PE Not Provided (17291):	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Related Activities:											
• PE 0305164F: GPS User Equipment (O&M)	3.194	4.830	1.387	0.000	1.387	0.945	0.839	0.938	1.098	0.000	0.000
• PE 0305164F (1): GPS User Equipment (APAF)	9.568	19.122	8.198	0.000	8.198	10.222	9.551	9.916	10.304	0.000	0.000
	5.707	5.705	5.180	0.000	5.180	2.046	2.035	2.065	2.097	0.000	0.000

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C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• PE 0305164F (2): GPS User Equipment (OPAF)											
D. Acquisition Strategy											
<p>The GPS Wing acquisition strategy is to continue the development of GPS user equipment (UE) to support current warfighter activities and execute concept definition and technology risk reduction programs that will define and mature technologies needed for GPS Modernization. The GPS UE program will continue Selective Availability Anti-Spoofing Module (SAASM) receiver development /production and work with platforms/users to identify requirements and upgrade paths for GPS enhancements. Additionally, several anti-jam technology risk reduction efforts will be pursued to mature technologies and prepare for technology insertion to combat the potential threat that U.S. forces may be denied the use of GPS signals.</p> <p>The Modernized User Equipment (MUE) program awarded three contracts to produce demonstration YMCA capable receiver cards, and constitutes the technology development phase of the Military GPS User Equipment (MGUE) program. MUE is scheduled to deliver cards in FY10 with testing and certification to follow to demonstrate Technology Readiness Level (TRL) 6. The MGUE effort will include development of a Common GPS Module (CGM), that provides the core GPS signal processing functions within a secure module, and receiver cards for each domain (ground, air, maritime, and handheld). MGUE will meet the ASD/NII GPS user equipment policy memo and draft Capability Development Document (CDD) requirement.</p>											
E. Performance Metrics											
<p>Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.</p>											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Air Force											DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 3600: <i>Research, Development, Test & Evaluation, Air Force</i> BA 7: <i>Operational Systems Development</i>				R-1 ITEM NOMENCLATURE PE 0305164F: <i>NAVSTAR Global Positioning System User Equipment Space</i>				PROJECT 673028: <i>Navstar GPS</i>					
Product Development (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Receiver Technology	Various/ Various	Various Various	20.062	7.000	Nov 2009	6.500	Nov 2010	0.000		6.500	Continuing	Continuing	0.000
Advanced Antenna Technology	Various	Various Various	86.692	6.640	Nov 2009	5.609	Nov 2010	0.000		5.609	Continuing	Continuing	0.000
DOE Sandia (SAASM)	MIPR	Sandia National Labs Kirtland AFB, NM	52.440	0.600	Nov 2009	0.700	Nov 2010	0.000		0.700	Continuing	Continuing	0.000
Various (SAASM/GB-GRAM)	Various/ Various	Various Various	32.594	0.300	Nov 2009	0.400	Nov 2010	0.000		0.400	Continuing	Continuing	0.000
Various (Modernized UE)	Various/ Various	Various Various	428.984	79.472	Nov 2009	103.993	Nov 2010	0.000		103.993	Continuing	Continuing	0.000
Holloman AFB (Integration)	PO	46th Test Group Holloman AFB, NM	7.184	0.700	Nov 2009	0.800	Nov 2010	0.000		0.800	Continuing	Continuing	0.000
Completed UE Product Development Efforts	Various/ Various	Various Various	197.840	0.000		0.000		0.000		0.000	0.000	197.840	0.000
Subtotal			825.796	94.712		118.002		0.000		118.002			0.000
Remarks													

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Support (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Wing Support	Various/ Various	Various Various	71.224	33.188	Nov 2009	38.416	Nov 2010	0.000		38.416	Continuing	Continuing	0.000
SE/Program Spt/Joint Navwar Center (JNWC)	Various/ Various	Various Various	116.461	7.746	Nov 2009	7.978	Nov 2010	0.000		7.978	Continuing	Continuing	0.000
Completed Support Efforts	Various/ Various	Various Various	62.490	0.000		0.000		0.000		0.000	0.000	62.490	0.000
Subtotal			250.175	40.934		46.394		0.000		46.394			0.000
Remarks													
Test and Evaluation (\$ in Millions)													
				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
User Equipment Development & Production Testing	PO	46th Test Group Holloman AFB, NM	59.343	1.517	Nov 2009	1.540	Nov 2010	0.000		1.540	Continuing	Continuing	0.000
Subtotal			59.343	1.517		1.540		0.000		1.540			0.000
Remarks													

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	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,135.314	137.163		165.936		0.000		165.936			0.000
Remarks Total Prior Years Cost may include only FY 2009 data.											

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Exhibit R-4, RDT&E Schedule Profile: PB 2011 Air Force

DATE: February 2010

APPROPRIATION/BUDGET ACTIVITY

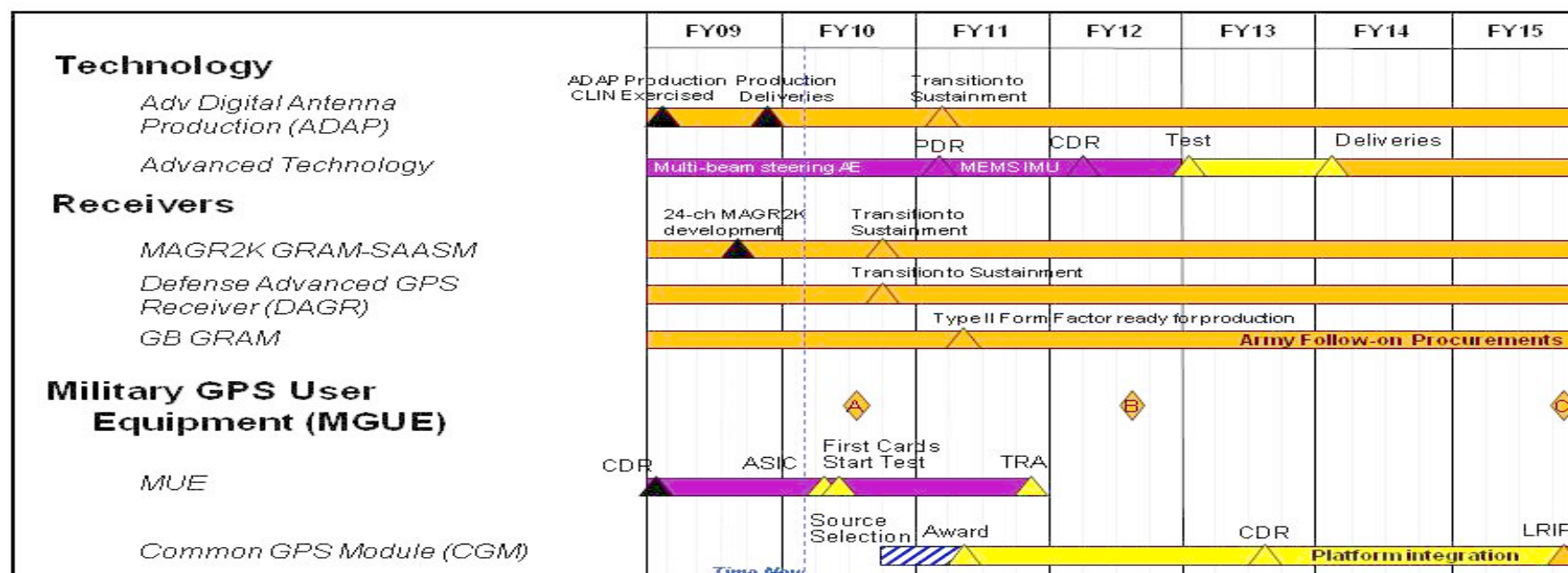
3600: Research, Development, Test & Evaluation, Air Force
BA 7: Operational Systems Development

R-1 ITEM NOMENCLATURE

PE 0305164F: NAVSTAR Global Positioning
System User Equipment Space

PROJECT

673028: Navstar GPS



AE – Antenna Electronics
ASIC – Application Specific Integrated Circuit
CDR – Critical Design Review
GB – Ground Based
GRAM – GPS Receiver Applications Module

LRIP – Low Rate Initial Production
MAGR2K – Miniaturized Airborne GPS 2000
MEMS IMU – Micro-Electronic Mechanical Inertial Measurement Unit
SAASM – Selective Availability Anti-Spoofing Module
TRA – Technical Readiness Assessment

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Air Force			DATE: February 2010
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Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
Advanced Digital Antenna Production (ADAP) Contract Award	1	2009	1	2009
Military User Equipment (MUE) Critical Design Review (CDR)	1	2009	1	2009
ADAP Deliveries Begin	4	2009	4	2009
Begin Military GPS User Equipment (MGUE) Technical Development Cards Delivery	2	2010	2	2010
MGUE Milestone A	3	2010	3	2010
MGUE Contract Award	2	2011	2	2011

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